



Using GIS to Help Support and Sustain U.S. Army Ranges - A Global Approach

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Army Sustainable Range Program (SRP) Geospatial Support Center
Army Garrison Fort A.P. Hill, Virginia, USA



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Agenda / Objectives



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- Provide a brief overview of the Sustainable Range Program (SRP)
- Provide an overview of the SRP Geospatial Support Center
- Highlight the agencies, installations, and offices that are directly supported by the SRP Geospatial Support Center
- Highlight procedures, products, and tools created in support of the SRP
- Highlight several projects executed at the SRP Geospatial Support Center
- So, how can Parsons support your geospatial mission?

Sustainable Range Program (SRP)



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- DoDD 3200.15 signed in August 2003
 - Established policy for the sustainment of all DoD ranges
- AR 350-19 established in September 2005
 - Defines the SRP and the responsibility within the SRP
- The Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability
- Maximizes the capability, availability, and accessibility of ranges and training lands to support doctrinal training and testing requirements, mobilization, and deployments under normal and surge conditions

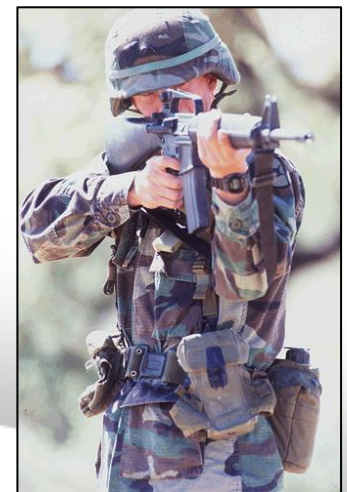


Sustainable Range Program (SRP)



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- The SRP includes two core programs, under the direction of Headquarters Department of the Army (HQDA) G-3 Training Simulations Division (DAMO-TRS)
- **Range and Training Land Program (RTLTP)**
 - Range Operations
 - Range Safety
 - Range Modernization
- **Integrated Training Area Management (ITAM) Program**
 - Land Rehabilitation and Maintenance (LRAM)
 - Range and Training Land Assessment (RTLTA)
 - Sustainable Range Awareness (SRA)
 - Training Requirements Integration (TRI)

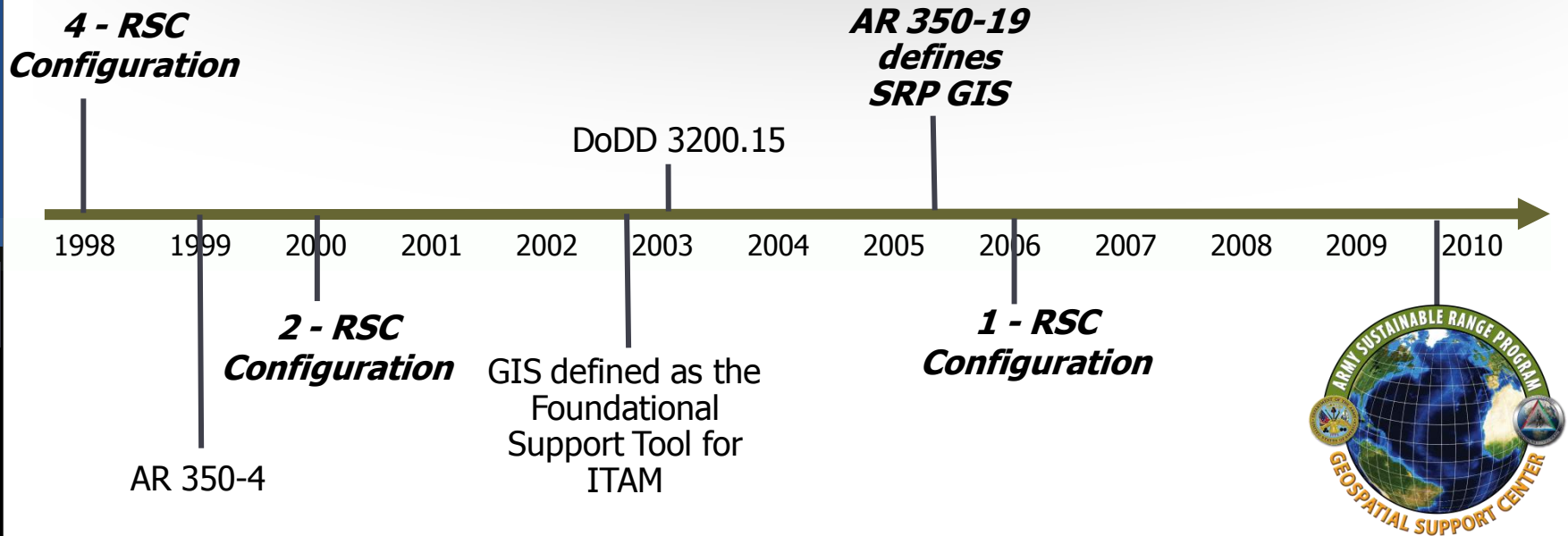


SRP Geospatial Support Center



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- As a tenant on Fort AP Hill, have been serving the Army since 1998
- Previously called the SRP GIS Regional Support Center



So why the name change?

- Increased focus on all HQ (G3/5/7) Range and Training Area analysis
- Haven't been regional since 2006 (Just didn't want to lose the RSC name)
- Dictate GIS guidance and standards for all Army Ranges and TAs

SRP Geospatial Support Center



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Mission Oriented Operation

- Designed to execute achievable goals and tasks
- Provide central service and support to the SRP

Structured Operation

- Standard Operating Procedures.
- Documented tool and application protocols

Flexible Implementation

- Sustainable Range Program is dynamic
- Army ranges and training are dynamic

Basic Goals

- Increasing the utility and cost effectiveness of GIS
- Increasing data compatibility
- Eliminating redundant GIS efforts
- Creating standardized products (Maps, data, etc.)



Geospatial Support Center Teams



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Who we support



- Support over 225 Installations / Training Areas / LTAs / Sites
- Installations are divided into Tiers (Tiers 1 – 3)
 - Size of Installation, Installation Mission, Active Duty Units, etc.
- Tiers dictate the level of GIS support we provide

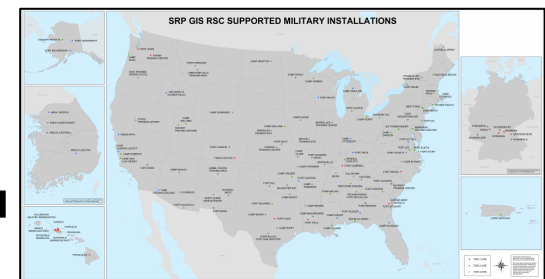
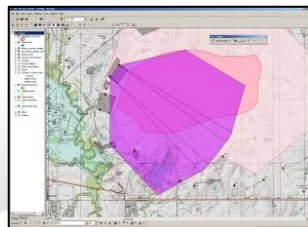
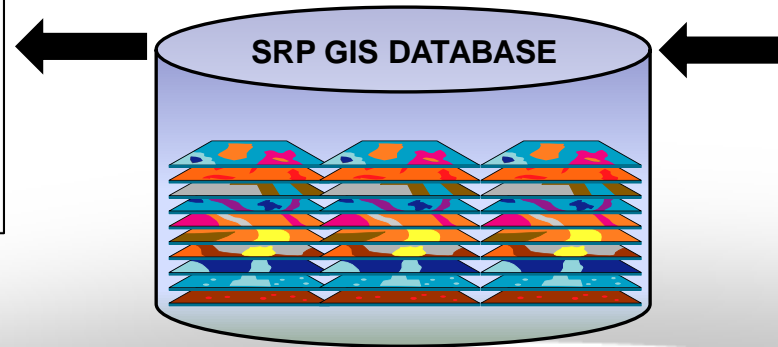
GIS Support Structure



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- Sites with a GIS Operator or that are regionally supported
 - Larger SRP Installations (Tier I and II)
 - Operated locally and supported by Geospatial Support Center ~ **175 Sites**
- Sites without a GIS Operator
 - Smaller SRP Installations (Tier III)
 - Centrally supported by Geospatial Support Center ~ **56 Sites**
- ★ Support includes:
 - SRP GIS Training Program
 - Military Installation Map (MIM) Development
 - Standards for Hardware, Software, Geospatial Data
 - Support in the procurement of Vector Data and Visualization Data/Imagery
 - RFMSS Graphic Fire Desk Data Support
 - GIS Technical Support (Centralized Expertise)
 - Testing and Evaluation of GIS software/applications
 - Data Development / Acquisition / Standardization
 - Site Visits (Training and GPS)
 - Data Repository for HQDA Analysis (Dedicated Offsite Back-ups)
 - Augment Existing Support

-

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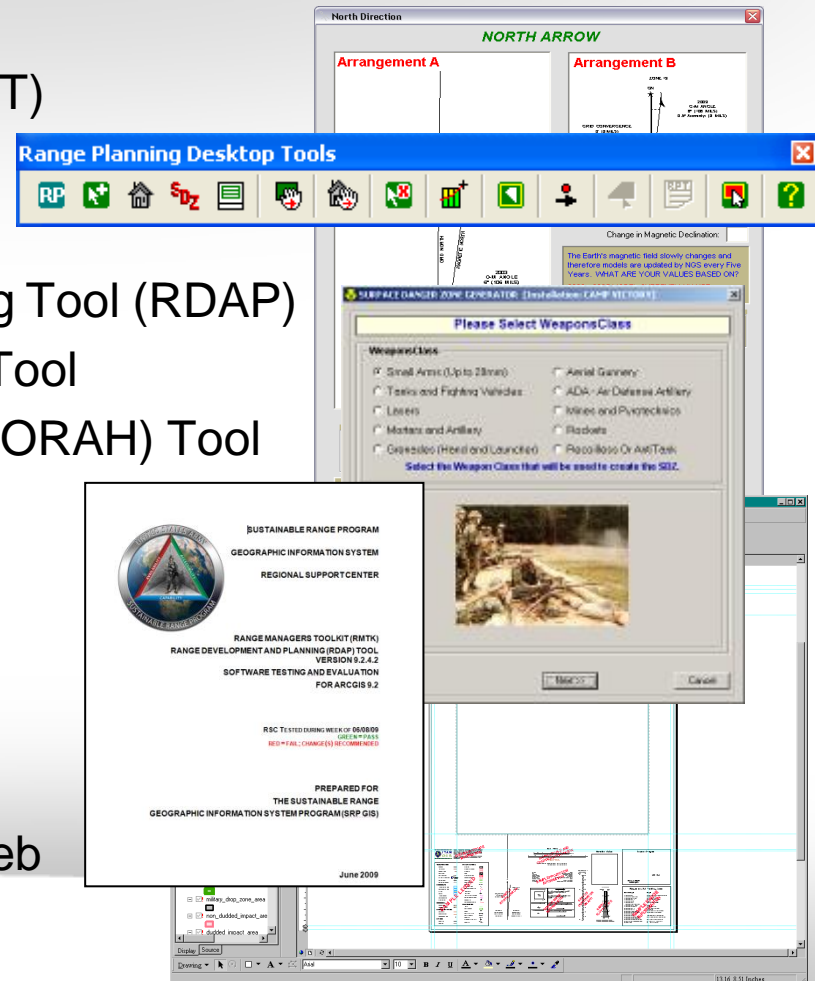
SRP Tools and Application Support



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- Execute and document Software Qualification Test (SQT) for all tools
- Provide all technical support to Army range community

- Military Installation Map Toolkit (MIMT)
- Range Managers Toolkit (RMTK)
 - Surface Danger Zone (SDZ) Tool
 - Range Development and Planning Tool (RDAP)
 - Explosive Training Range (ETR) Tool
 - On Range Ammunition Handling (ORAH) Tool
 - Noise Tool (*Planning Tool*)
- SRP Metadata Editor Tool (SMET)
 - In Development
- SRP GIS Tracker



All tools are downloadable on SRPWeb

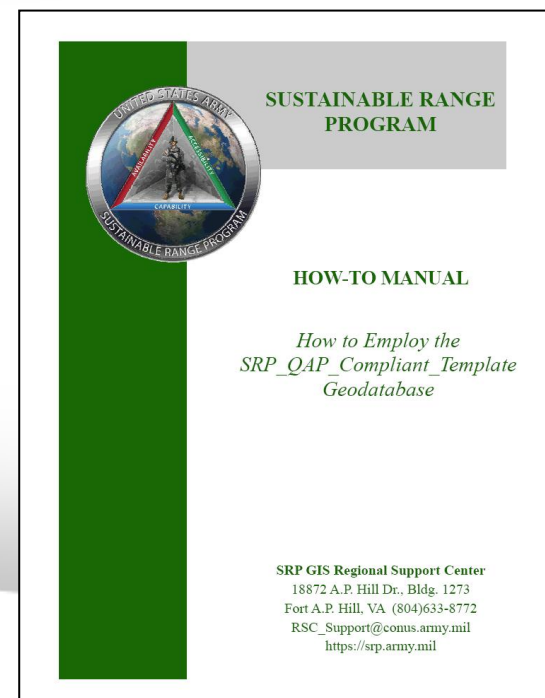
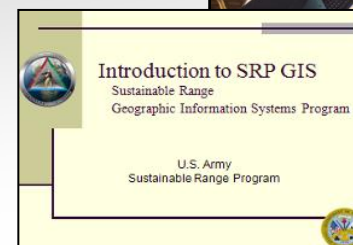
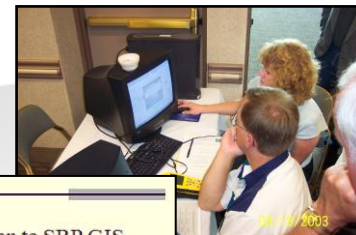
<https://srp.army.mil>

GIS Training Support



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- Online SRP GIS Professional Training Course
 - Overview of SRP GIS Program
 - Protocols and Procedures
 - Tips to best support the installation
- SRP GIS Technical Articles
 - Topology Tricks and Tips
 - Quality Assurance Plans for GIS Data
 - Military Installation Map
 - GeoPDF
- SRP GIS Procedural “How-to’s”
 - How to make a data dictionary
 - How to use the SRP QAP geodatabase
- GIS for Range Staff Course
 - Range Safety Tools and basic GIS training
- Workshops and Conferences



SRP Data Standards



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- **Integral component in defining all SRP Geospatial standards**
 - SRP GIS Quality Assurance Plans (QAPs)
 - Defined by the HQ Proponency matrix (DPTMS/Range)
- **Created**
 - SRP GIS Symbology
 - SRP GIS Map Templates
 - SRP GIS Technical Documents
 - SRP GIS Topology Rules
 - SRP GIS Metadata Standard
 - SRP GIS Data Dictionary
 - SRP Template Geodatabase

Sustainable Range Program Quality Assurance Plan Military Range Area, FY09

MILITARY RANGE AREA

1. DESCRIPTION

The military range area layer represents controlled areas that allow the firing of live ammunition from direct-fire or line-of-sight weapons systems at targets within the controlled area, subject to certain conditions. Typically, a range area is a functional complex that normally includes a firing line, and downrange targets blast safety zones that can have a score target hits, and provide the purposes.

Common names for this feature type are live-fire range footprint, firing area.

2. PROPONENTS AND STEWARDS

The Army functional proponent for the Director of Plans, Training, Management (JMCOM) will have the overall responsibility for the range area and accuracy of the military range area. The Army functional proponent for the military range area is the Management Office-Training Support.

3. POLICY AND REGULATIONS

Program(s)	Installation
- AR 211	16 May
- AR 415	16 May
- DA PA	September
- DA PA	April 2
- DODD	January
- DODD	January
- DODD	10 May
- DODD	12 July
- DODD	12 July

Edwards_SRP.mdb

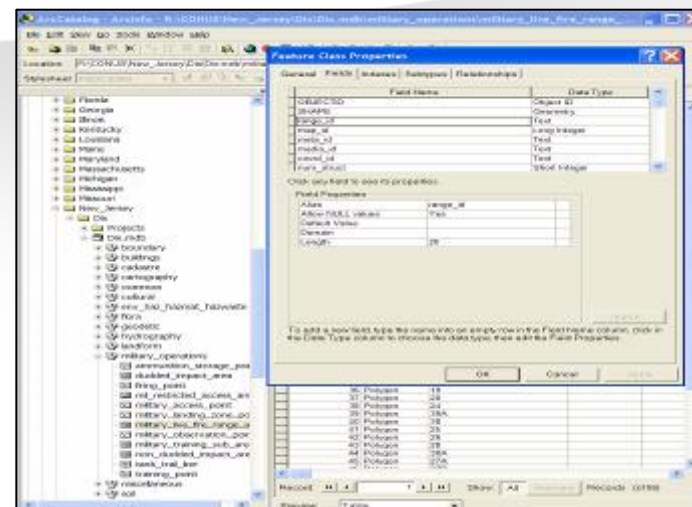
- common
 - coordinate_grid_area
 - coordinate_grid_line
 - coordinate_grid_point
- military_operations
 - ammunition_storage_area
 - firing_point
 - impact_area
 - impact_buffer_area
 - mil_restricted_access_area
 - mil_special_use_airspace_area
 - military_landing_zone_area
 - military_landing_zone_point
 - military_observation_point
 - military_range_area
 - military_safety_marker_point
 - military_target_point
 - range_controller_point
 - training_area
 - training_point
- transportation_air
 - airspace_obstruct_navaid_point
 - j_trainsobs_air_obs_id

Data Development Team Projects



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- Following all geospatial standards and SRP protocols, create and maintain geospatial data for 56 installations in support of land management and mission planning
- Created and maintain over 600 military operation feature classes for the 56 installations
- Visit 25 – 30 Installations per year for GPS data collection
- Since this data is used for safety, driving range development decisions, stewardship; all data is GPSed to include every firing point, target, etc.
- Very important as data drives everything we do and support.



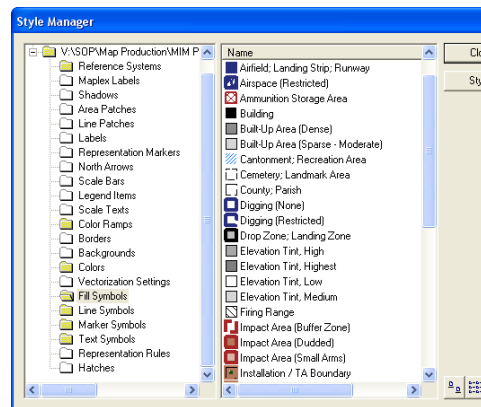
Map Development Team Projects



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Military Installation Maps (MIM)

- Created a MIM template (.mxt) based on layout of previously produced NGA MIMs and supporting documentation.
- Created standard MIM symbology which contains symbols, labels, and tints based on existing DoD and NGA standards.
- Created MIM Production Guidance Documentation



MIM Production Guidance Documentation

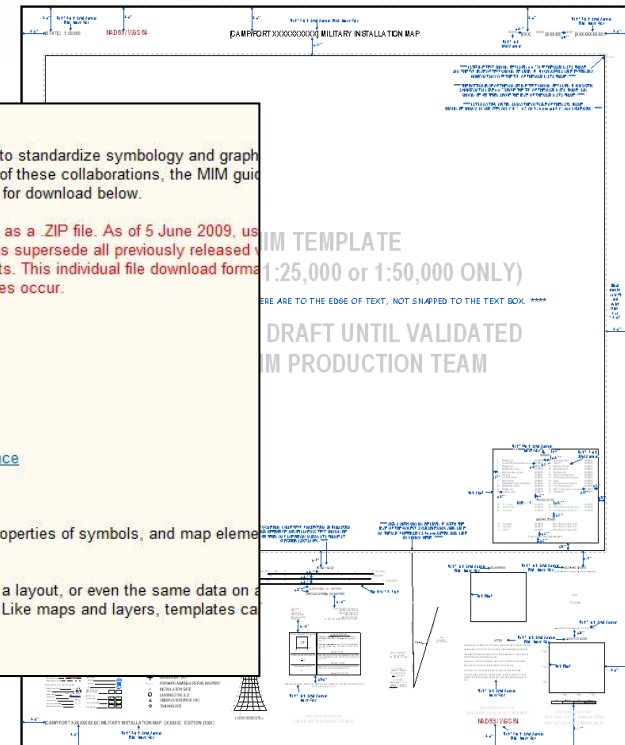
The SRP GIS Program has worked closely with Army G-2 and NGA to standardize symbology and graphics they train across Army training and testing installations. As a result of these collaborations, the MIM guidance and the MIM Production Guidance Documentation (MPGD), are available for download below.

NOTE: Previously, the MPGD was available for download collectively as a .ZIP file. As of 5 June 2009, user files (symbols, templates) are now available for download, and these files supersede all previously released files below to ensure compliance with current MIM production requirements. This individual file download format will ensure that persons can be notified when updates to individual files occur.

[Memorandum - Production of Military Installation Maps \(MIMs\)](#)
[Production Specifications for Military Installation Maps \(MIMs\)](#)
[Appendix A - Required Data Layers for the MIM](#)
[Appendix B - Additional SRP Proponent Data Layer Requirements](#)
[Appendix C - Non-Proponent Data Layer Requirements](#)
[Appendix D - MIM Spacing & Font Requirements](#)
[Appendix E - MIM Layout Examples](#)
[Appendix F - FAQ Regarding MIM Development and Quality Assurance](#)
[Appendix G - MIM Finishing Review Checklist](#)
[Appendix H - MIM Approval Signature Document](#)

MIM Style (An organized collection of predefined colors, symbols, properties of symbols, and map elements used to create mapping products.)

MIM Template (Map templates make it easy to reuse or standardize a layout, or even the same data on a map. You don't have to manually reproduce the common parts of the map. Like maps and layers, templates can be used to standardize the maps that we produce.)



Map Development Team Projects



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Military Installation Maps (MIM)

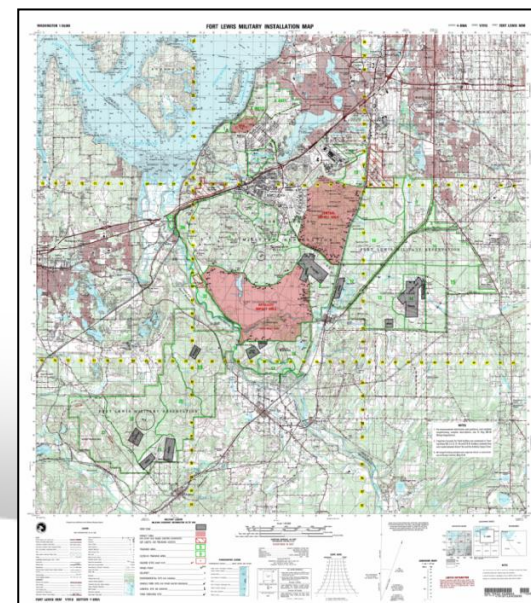
- G-2, SRP, and NGA signed Memorandum of Agreement (MOA) on 9 Feb 09 to formalize support for MIM production



- 32 MIM sheets have been finalized and validated by SRP since 2007
- 29 of these have been printed by NGA, and are currently in stock at DLA, with 2 more ready for printing



- Export finalized MIMs to GeoPDF format, and they are posted to SRPWeb as well as the Army Geospatial Center (AGC) website, and are available for download



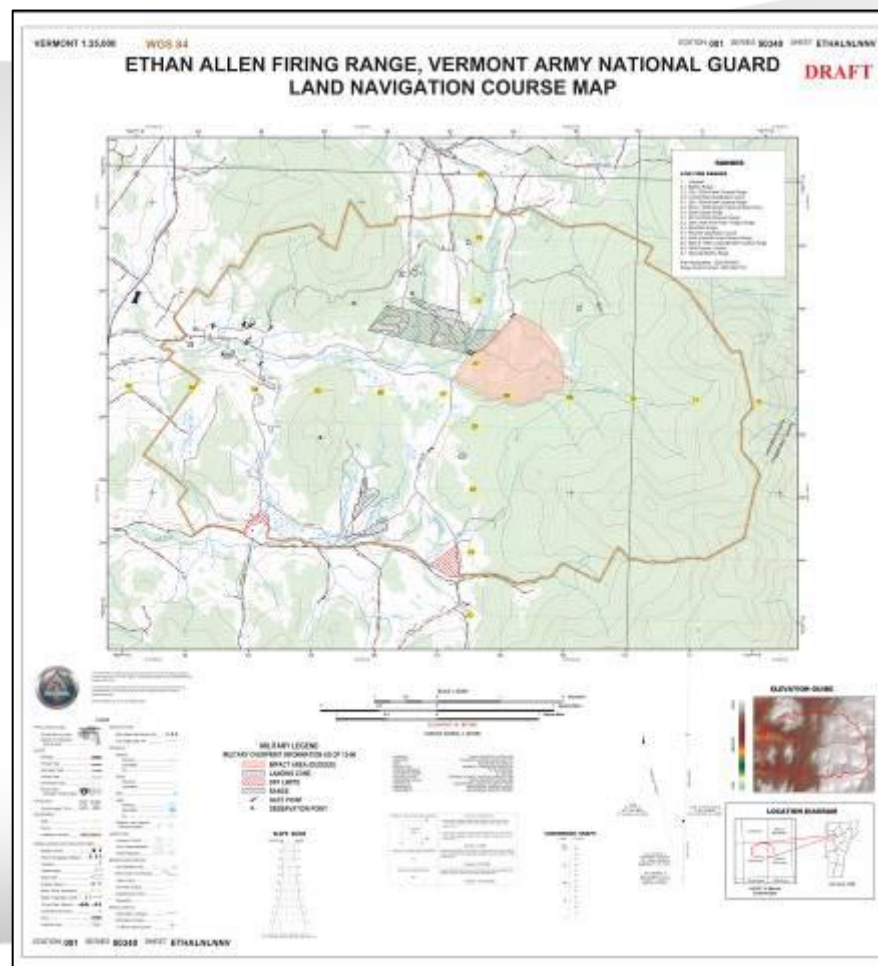
Map Development Team Projects



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Custom Map Production

- Training Scenarios
- Land Navigation
- Range Planning
- Range Analysis
- Situational Maps
- Emergency Response
- MOUT Site Maps
- Impacts to Training
- Range Safety
- DoD Proximity Maps
- Land Management
- Land Disturbance



[illegible]

MIM SHEET IDENTIFICATION INFORMATION				Requirement satisfied. Comment occasionally provided.
Sheet Name:	XXXXXXXXXXXXXXX			Requirement not satisfied. Verification by installation staff required.
Series Number:	X7YJS or X8OOS			Requirement not satisfied. Further instruction provided.
Edition Number:	GXX			Requirement not currently applicable to the MIM.
Reviewer:	SRP/GIS Regional Support Center			
Date:	XX / XX / 20XX			
DATA QUALITY ITEM	REQUIREMENT	STATUS	COMMENT	
Source Materials Quality Assessment	Source materials documented / obtained for all data layers being included on map. All data layers complete (all features included) when compared to stated source materials. All data layers pass QA/QC assessment when compared to stated source materials. Geodetic tab run acquired for all map sheets.			
GEODETIC INFO & MARGINALIA ITEM	REQUIREMENT	STATUS	COMMENT	
Sheet Identification	State name in upper left margin identifier Scale of map is either 1:25,000 or 1:50,000 Installation / sheet name entered into title, upper right margin identifier, and lower left margin identifier Edition entered in upper right margin identifier and lower left margin identifier <u>NCA series number entered in upper right margin identifier and lower left margin identifier.</u> Measurement of projection dimensions agrees with geodetic tab run. Geographic coordinates labeled and spaced correctly on all four corners. All geographic Ticks shown, and 5 ticks labeled Interior geographic intercepts (latitude/longitude ticks) at 5' shown. "One second" notes correct on all four sides (latitude notes read from east) Data frame rotated prior to converting graphic to graphic.			
Projection	Measurement of grid lines from projection corners agrees with geodetic tab run. Full Easting and Northing grid values on SW corner for first grid lines shown (not necessarily full tile) Each line of major grid labeled - small numbers included for each 10,000m grid number. 1,000 meter and 10,000 meter grid lines symbolized properly.			
Grid - Major	Number of rows and columns measured. (see attached spreadsheet)			(NCA N/A if applicable)
Legend	TLM FINISHING REVIEW CHECKLIST (covers 1:50 and 1:100) Sheet # _____ Series ID: _____ Edition # _____ Reviewer: _____ Producer/Contractor: _____ Date: _____			
Military Legend	SOURCE MATERIALS Extraction plots, CD with file entries Geographic coordinates agreed correctly on all corners Overlays showing timing and appropriate north arrow location (normal/true/magnetic POC) DOWNS, AN/P, MEDS, Geospatial Reference Plan			alphabetically within legend
Conversion Graph	GEODETIC INFO & MARGINALIA PROJECTION Measurement of projection dimensions agree with geodetic tab run All geographic one-minute ticks are shown and 3 (1:50) or 12 (1:100) ticks labeled Interior geographic intercepts at 1' (1:50) or 1' (1:100) noted read from east "One second" notes correct on all four sides (latitude notes read from east) Units - check off all of above listed "One second" notes only if scales are different than base map(s) GRID - MAJOR Measurement of grid lines from projection corners agree with geodetic information Full Easting and Northing grid values on SW corner for first grid lines shown (not necessarily full tile) Each line of major grid is labeled - include small numbers for each 10,000m grid number Grid value corner and inner corner labels 10,000 meter grid lines are meter measurements 100,000 meter square identify shown in the center of 1:100k if applicable; same color as major grid Zone portion area shown (if applicable) Insets - check all of the above (labeler verifies) GRID - OVERLAY APPLICABLE (when available) Check for overprints on map Measurement of grid links (show outside projection) from projection corner agrees with geodetic information First and last on each corner agree with lat lon corner grid coordinates Full Easting and Northing grid values on SW corner for first grid lines shown All surrounding grid lines are present and are the same color as major grid lines 100,000 meter squares identified Each line and ten thousand meter link is labeled - include small numbers for each 10,000m grid number Grid tick values correct and evenly spaced Insets - check all of the above GRID REFERENCE BOX Grid reference box is shown within the map 100,000 meter square located within the 100,000 m valued corner per TM A-50B Grid zone designation corner per TM A-50B 100 meter reference rectangle applied, labeled to show Inset - 100,000 meter square (shown) shows made inset (if different than base map) DENOTATIONS/DENOMINATORS 2000 Epoch date Diagram and notes are same color as major grid (line diagram)			no signs of register
Scale Bar(s) / Note(s)	Unclassified -FOUO			
Geodetic Notes	REPORT OF FORT STEWART MILITARY INSTALLATION MAP EVALUATION (V74SS FTSTEWAMM 004) Military Installation Map was evaluated using georeferenced NTM stereo imagery to see for comparison (road intersections, stream intersections, etc.). The differences were derived from the map and the imagery where they used to compute the statistics. Points were selected for the evaluation (see Figure 1 below). 			
Version B	1	11/3/06		

feature accuracy and (CMAS)

100

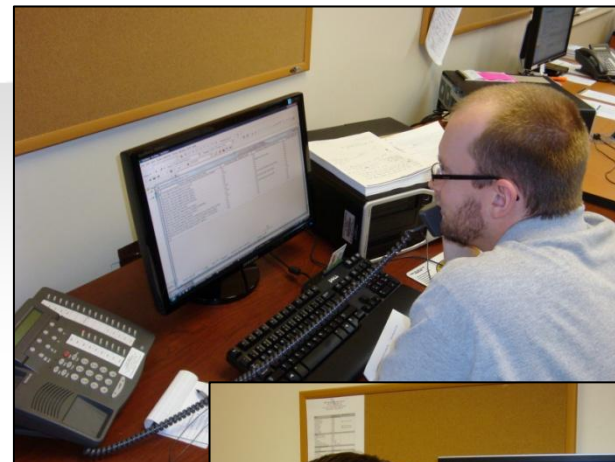
QCP Report: [INSTALLATION NAME]			COMPLETION DATE: [YYYYMMDD]								
Feature Dataset	Feature Class (SDE/Non-SDE)	Proposed Priority	Geographic Features(s) Exist	Statistics Pass = 1 Fail = 0	Topology Pass = 1 Fail = 0	Attribute Table Pass = 1 Fail = 0	Spatial Accuracy Pass = 1 Fail = 0	Source(s)	Comments	REPORT CARD	QCP REPORT CARD
SRP GIS GAP GEOSPATIAL DATA LAYERS											
Boundary	evaluation_corridor_area	Optional									0
	evaluation_route_line	Required									0
	coordinate_grid_area	Required									0
	coordinate_grid_line	Required									0
	coordinate_grid_point	Optional									0
	feature_evaluation_point	Required									0
	file_evaluation_point	Required									0
	file_evaluation_area	Required									0
	file_evaluation_line	Required									0
	file_evaluation_area	Required									0
Data Access	file_evaluation_area	Optional									0
	file_evaluation_point	Required									0
	evaluation_storage_area	Required									0
	evaluation_storage_point	Optional									0
	file_evaluation_area	Required									0
	file_evaluation_line	Required									0
	file_evaluation_point	Required									0
	file_evaluation_storage_area	Optional									0
	file_evaluation_storage_point	Optional									0
	file_evaluation_storage_area	Optional									0
Data Access	file_evaluation_storage_area	Optional									0
	file_evaluation_storage_point	Optional									0
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	file_evaluation_storage_area	Optional									0
	file_evaluation_storage_point	Optional		</							

Technical Support



PARSONS

- Annually, the RSC averages over 600 GIS technical support calls
- Topics include:
 - RMTK (All tools)
 - MIM Development
 - QAP/Data Development
 - Data Acquisition
- The RSC created and maintained a technical support log tracker to manage and track all SRP GIS related questions
 - This allows for searching on answers to redundant questions

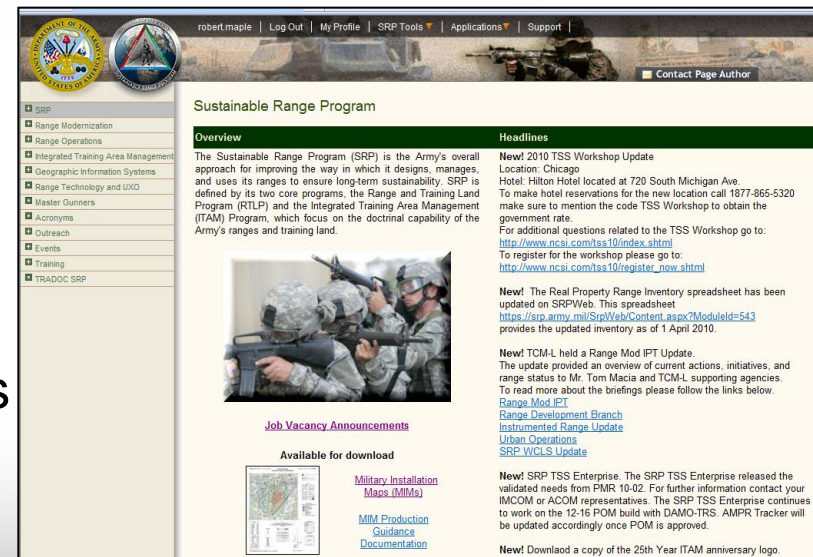


SRP GIS Website Statistics



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- SRPWeb (<https://srp.army.mil>)
- From 1 Oct 07 to present, there were 39,285 individual SRP GIS webpage hits with over 22,000 SRP GIS files downloaded from the SRPWeb library to include:
 - 7,523 Military Installation Maps
 - 5,653 guidance documents
 - 1081 “How-To” documents
 - 3,920 tools
 - 672 SRP GIS Technical Articles
 - 531 SRP GIS Courses



In Summary

- Provided a snapshot of the work executed at the SRP Geospatial Support Center
- The SRP Geospatial Support Center is:
 - ❖ Mission Oriented
 - ❖ Structured Operation
 - ❖ Striving for standard products and data
 - ❖ Dynamic and Flexible
 - ❖ GIS Center of Excellence
 - ❖ Time tested success (12+ years)



Points of Contact



PARSONS

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